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ABSTRACT

A follow-up study of children who began school at age 4 was conducted to examine the influence of three different preschool models (child-initiated, academically-directed, or a "combination" approach) on later school success. These children from an urban school district were studied again in Year 5 as they prepared to leave the primary grades and in Year 6 when they were scheduled to enter fourth grade if not previously retained. The study examined report card grades, retention rates, and special education placement of 160 children at the end of their fifth year in school and 183 children at the end of their sixth year in school. The sample was 96 percent African American; 54 percent of the sample was female. Seventy-five percent of the children qualified for subsidized school lunch, and 73 percent were living in single-parent families. Academically, girls surpassed boys at the end of Year 5, and this difference persisted into the next grade level. Children whose preschool experience was more academically directed had been retained less often than their peers. No differences attributable to preschool model were found for special education placement. By the end of children's fifth year in school, there were no differences in academic performance of children who had experienced the three different preschool models. By the end of their sixth year in school, children whose preschool experiences had been academically directed earned significantly lower grades compared to children who had attended child-initiated preschool classes. Children's later school success appears to have been enhanced by more active, child-initiated early learning experiences. Their progress may have been slowed by overly academic preschool experiences that introduced formalized learning experiences too early for most children's developmental status. (Contains 39 references.) (Author/HTH)

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Moving up the Grades: Relationship between Preschool Model and Later School Success

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Abstract

A follow-up study of children who began school at age 4 (referred to as Year 1 in this study) was conducted to examine the influence of three different preschool models on later school success. These children from an urban school district were studied again in Year 5 as they prepared to leave the primary grades and in Year 6 when they were scheduled to enter fourth grade if not previously retained. The study examined report card grades, retention rates, and special education placement of 160 children at the end of their fifth year in school and 183 children at the end of their sixth year in school. The sample was 96% African American and 54% female, with 75% of the children qualifying for subsidized school lunch and 73% living in single-parent families. Academically, girls surpassed boys at the end of Year 5, and this difference persisted into the next grade level. Children whose preschool experience was more academically directed had been retained less often than peers. No differences attributable to preschool model were found for special education placement. By the end of children's fifth year in school, there were no significant differences in academic performance of children who had experienced three different preschool models. By the end of their sixth year in school, children whose preschool experiences had been academically directed earned significantly lower grades compared to children who had attended child-initiated preschool classes. Children's later school success appears to have been enhanced by more active, child-initiated early learning experiences. Their progress may have been slowed by overly academic preschool experiences that introduced formalized learning experiences too early for most children's developmental status.

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Introduction

In the ongoing debate over education reform designed to improve academic performance of American children, preschools are under increasing pressure to offer instruction in basic academic skills. This trend is especially prevalent in programs that serve low-income children. Compensatory early childhood programs such as Head Start and state-sponsored pre-kindergarten for low-income families and preschoolers with special needs are designed to help children acquire skills needed for later school success. Although the goal of school readiness is widely shared among early childhood educators, parents, and policy makers, the strategies for achieving this goal vary greatly. Fundamental philosophical and political differences in beliefs about the purpose of schooling, value orientations, and cultural priorities

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are central to the debate on how to best prepare young children for formal schooling (Kessler, 1991).

Kindergarten retention rates have increased (e.g., Shepard & Smith, 1988), perhaps due to the downward shift in curriculum that introduces formal reading and mathematics instruction much earlier. Escalating academic demands in kindergarten have clearly affected preschool programs for even younger children. Goffin (1994) noted a downward movement of the debate between developmental and academic orientations from elementary education to the preschool setting. When preschool was "reconceptualized as an appropriate beginning for primary schooling (especially for low-income children)," public school programs for 4-year-olds grew in number (Goffin, 1994, p. 120).

Beginning in the 1980s, leading early childhood experts expressed concern about the wisdom of overly didactic, formal instructional practices for young children (e.g., Elkind, 1986; Zigler, 1987). They feared that short-term academic gains would be offset by long-term stifling of children's motivation and self-initiated learning. Later research suggests that these early concerns were warranted. Compared to children whose kindergarten experience emphasized child-initiated learning, primary-grade teachers rated children from didactic, teacher-centered kindergartens lower in conduct and work-study habits, and perceived them to be more distractible, less willing to follow directions, and less prosocial (Hart, Charlesworth, Burts, & DeWolf, 1993). Stipek, Feiler, Daniels, and Milburn (1995) also found motivational differences favoring a child-initiated view of early education compared to a more formalized, didactic approach. They cautioned that early academic gains in reading skills associated with didactic instruction of preschoolers "come with some costs" that could have long-term negative effects on achievement. DeVries, Reese-Learned, and Morgan (1991) expressed similar concerns, arguing that temporary benefits of highly didactic approaches with young children cannot be justified in light of possible negative consequences for social development. Today, as Walsh (1989) predicted, the likelihood that children will experience a highly didactic, teacher-centered approach has increased as preschool is absorbed into public schools where a narrowly focused, externally imposed curriculum makes the preschool experience even more like elementary school.

Although it was once believed that any well-implemented preschool program would achieve positive results (e.g., Lazar, Darlington, Murray, Royce, & Snipper, 1982), a growing research base suggests otherwise (see Marcon, 1999, for a review of research on different preschool approaches). Of particular interest in the present study was sustainability of an earlier preschool approach's influence on academic performance. Several researchers have found that later school success declined when the intervention was discontinued. For example, Miller and Dyer (1975) found a drop in school achievement for children who entered a nondidactic program following a direct instruction preschool experience. Similarly, when the highly didactic Direct Instructional System for the Teaching of Arithmetic and Reading (DISTAR) was discontinued after third grade, children's previously high achievement in reading and mathematics declined (Becker & Gersten, 1982). Early academic success fostered by a child-initiated approach has been documented by a number of different researchers (e.g., Burts, Hart, Charlesworth, & DeWolf, 1993; Marcon, 1993, 1999; Weikart, Epstein, Schweinhart, & Bond, 1978). Some long-term benefits of this approach have been found for school achievement (e.g., Miller & Bizzell, 1984) as well as for social behavior and general school competence (e.g., Schweinhart & Weikart, 1997; Schweinhart, Weikart, & Larner, 1986). Little is known, however, about the long-term effect of early intervention that combines didactic, teacher-centered strategies with child-initiated learning experiences. In the short term, this combination approach has varying

outcomes, with some research favoring the strategy, especially for lower functioning children (e.g., Mills, Dale, Cole, & Jenkins, 1995). A preponderance of the research evidence, however, has failed to support the combination approach (e.g., DeVries et al., 1991; Marcon, 1999; Pfannenstiel & Schattgen, 1997; Rawl & O'Tuel, 1982). Knowing how later school success of these children compares with that of children exposed to other preschool models would be useful in determining the effectiveness of a combination strategy.

A second area of interest in the present study involved sex differences in later school success. Academically, studies of low-income children have found that girls did better than boys in pre-kindergarten (e.g., Marcon, 1999), kindergarten (e.g., Burts et al., 1993; Marcon, 1993), and in first grade (e.g., Reynolds, 1989). Boys do notably better in both the short and long term when their early learning experiences have been more child initiated rather than more didactic in nature (e.g., Marcon, 1993; Miller & Bizzell, 1984). Successful transition between grade levels may also be moderated by sex. Parents and principals believe boys have more difficulty than girls in making the transition from third to fourth grade (Mayfield, 1983). Furthermore, differences in school competence (especially rates of nonpromotion) among African American children may be intensified by negative attitudes and behaviors toward school exhibited as early as fourth grade by African American boys (Rowan, 1989). Further examination of sex differences in later school success of low-income children and possible interaction with preschool model would add to our understanding of the often difficult transition from the primary to the later elementary school grades.

The present study provides follow-up data for one cohort of low-income, minority children who had attended two years of school (preschool and kindergarten) prior to entering first grade. These children had experienced one of three different types of preschool: child-initiated, academically directed, or a "combination" approach. In this earlier quasi-experimental study, Marcon (1999) compared the three different approaches for their effect on children's development and mastery of basic skills at the end of preschool. Findings indicated that children whose preschool experiences had been child-initiated demonstrated greater mastery of basic skills at the end of preschool than did children in programs where academics were emphasized and skills were directly taught. At the end of preschool, children in the "combination" model did significantly poorer on all measures except self-help and development of social coping skills compared to children in either the child-initiated or academically directed models. Preschool girls outperformed boys in all areas except gross motor development and play/leisure skills. This follow-up study examines the transition from children's fifth to sixth year in school (third to fourth grade for most of these children). Based on earlier findings for these children and results of other research studies (e.g., Miller & Bizzell, 1984; Schweinhart & Weikart, 1997; Schweinhart, Weikart, & Larner, 1986), it was thought that any difference in later school success attributable to preschool model would favor the child-initiated early learning approach. Children who had experienced "combination" preschool curricula were expected to be least successful, whereas later school performance of those who had attended didactic, teacher-centered preschools was expected to be intermediary. Sex differences in school achievement favoring girls were expected to persist because boys, in general, do not perform as well in the early years of school (Richardson, Koller, & Katz, 1986), and African American boys, unlike boys in general, do not typically show a rise in school achievement following the elementary school years (Pollard, 1993). The type of preschool experience was expected to have a greater effect on later school achievement of boys than on girls.

Method

Participants

Children who began school at age 4 (referred to as Year 1 in this study) were studied again in Year 5 (when they were expected to be in third grade if not previously retained) and Year 6 (when they were expected to be in fourth grade if not previously retained) of their educational experience. This sample of urban students included 160 Year 5 children (*M* age = 107.6 months, *SD* = 3.9) in 61 schools and 183 Year 6 children (*M* age = 119.8 months, *SD* = 3.6) in 70 schools. The initial sample had been randomly selected proportional to enrollment of 4-year-olds in subdistricts within the school system. Each subdistrict was represented by at least one classroom for each of the three models studied. This stratified sample was geographically dispersed across the city and was representative of socioeconomic, administrative, and local variations within the school system (see Marcon, 1992, for a description of random selection and stratification procedures used in the original cohort study).

This follow-up sample from the original cohort was 96% African American and 54% female. Most children (75%) qualified for subsidized school lunch based on low family income, and 73% of the children lived in single-parent families. Data from both Years 5 and 6 were available for a subsample of the children (n = 139) in 64 schools. Subsample children did not differ significantly from the larger follow-up sample in any demographic characteristics.

Recovery rate from preschool to fourth grade was 64% of the original sample. Although this attrition rate was high, it was not unexpected, and attrition was comparable across the preschool models, $\chi^2(2) = 1.80$, $p = .41$. The recovered follow-up sample was not significantly different from the original preschool sample in terms of gender ($p = .92$), age ($p = .82$), parent involvement ($p = .34$), overall adaptive behavior ($p = .16$), social and work habits ($p = .23$), or physical development ($p = .15$) in preschool. Preschool grades of children in the recovered follow-up sample were, however, 3% lower than the original sample ($p = .02$). Compared to the original preschool sample, the recovered follow-up sample had more African American and fewer White children, $\chi^2(3) = 15.34$, $p = .01$, who were poorer, $\chi^2(1) = 12.60$, $p < .001$, and more likely to live in single-parent families, $\chi^2(1) = 4.83$, $p = .03$. These differences were consistent with school districtwide changes in enrollment patterns following pre-kindergarten and kindergarten when children of many middle-class families leave the public school system.

At age 4, all children had attended free, full-school-day preschool in the same urban school district, with approximately 84% of the sample having been enrolled in pre-kindergarten and 16% in Head Start. Eligibility for pre-kindergarten was based solely on age and residency, whereas Head Start eligibility had an additional federal requirement of low family income. All preschool teachers of children in this study, both pre-kindergarten and Head Start, held a bachelor's degree or higher. Their median pre-kindergarten or Head Start teaching experience was approximately 10 years. As previously classified (see "Measures and Procedures" section for details), approximately 33% of children in this follow-up sample had attended preschool classes that followed a child-initiated approach, 35% attended academically directed preschool classes, and the remaining 32% had been enrolled in middle-of-the-road preschool classes that combined the other two preschool approaches. No Head Start classes in this school district used an academically directed approach. Kindergarten in this school district was predominantly academic in focus, with all but a handful of teachers indicating a strong belief that academic preparation was a more important goal of kindergarten than children's socioemotional growth (Marcon, 1990, 1993). All first-grade teachers in this school district emphasized academics, with approximately two-thirds using a highly didactic, academically directed approach (Marcon,

1990).

Measures and Procedures

Preschool Model. The Pre-K Survey of Beliefs and Practices (see Marcon, 1999, for instrument and details) was used to classify children's early learning experiences based on five theoretical differences between early childhood models: (1) scope of developmental goals, (2) conception of how children learn, (3) amount of autonomy given to the child, (4) conception of teacher's role, and (5) provision of possibilities for learning from peers. Three groupings identified through cluster analysis using Ward's method were selected as examples of the divergent preschool models operating in this urban school system. One group was composed of child development-oriented teachers who facilitated learning by allowing children to actively direct the focus of their learning. These *child-initiated* preschool classrooms were referred to as Model CI. Another group represented more academically oriented teachers who preferred more direct instruction and teacher-directed learning experiences for preschoolers. These *academically directed* preschool classrooms were referred to as Model AD. The third group represented teachers whose beliefs and practices fell in between the other two opposing models by endorsing a combination approach. These *middle-of-the-road* preschool classrooms were referred to as Model M.

In the original study, accuracy of model classification based upon survey response was affirmed by independent classroom observers, and findings were congruous with other research demonstrating strong consistency between outside raters' observations of early childhood instructional activities and teachers' self-reported beliefs and practices (e.g., Charlesworth, Hart, Burts, Mosley, & Fleege, 1993; Hyson, Hirsch-Pasek, & Rescorla,1990; Kagan & Smith, 1988; Vartuli, 1999). In the original study, Model CI and Model AD classifications were easily verified by independent classroom observers, but these same observers had some difficulty categorizing Model M practices in several classrooms. Model M teachers appeared to be closer to Model CI in goals but more like Model AD in teacher initiation of activities. Compared to Model CI teachers, the Model M teacher was notably more engaged in leading groups of children in less-individualized activities for longer periods of time. Compared to Model AD teachers, the Model M teacher allowed children greater access to classroom materials, encouraged more peer interaction, and initiated fewer teacher-directed cognitive activities that were not well integrated with other developmental domains. These Model M teachers were not, however, using a Vygotskian approach to foster children's early learning and development. Model M teachers were best described as professionals who sought to blend notions of child development with their school system's competency-based curriculum. Their basis for doing so was most likely pragmatic.

Report Cards. Data were collected from teachers and school records at the end of Year 5 and Year 6. The school district's Elementary School Progress Report (report card) was used to compare children's classroom performance with the district's expectations for skills mastery. Like many urban school districts, a competency-based curriculum (CBC) was in place throughout most of the school system, and children were expected to demonstrate mastery of specific reading and arithmetic skills before advancing to the next grade level. CBC defined a skill as being mastered when a child could perform it upon request and provided teachers with three mastery assessment tasks for each reading and arithmetic objective (see McClure & Leigh, 1981, for details of this school system's CBC). For research purposes, Progress Report grades were converted to the standard 5-point numeric scale: 0 = F, 1 = D, 2 = C, 3 = B, and 4 = A.

Each child's overall grade point average (GPA) was calculated. Grades in each of 11 subject areas were also converted to numeric scores: arithmetic, reading, language, spelling, handwriting, social studies, science, art, music, health/physical education (PE), and citizenship. Citizenship grades provided a global assessment of a child's deportment while attending school. School records and teacher report provided information on the child's eligibility for subsidized school lunch and the number of parents or guardians living at home with the child (scored as 1 or 2).

Results

School Competence: Special Education Placement and Retention

Year 5. During the primary grades (first, second, and third grades), this school district was more inclined to use retention in grade rather than special education services for children who experienced academic difficulties. By Year 5, less than 1% of this random sample had received special education services, whereas 20% had been retained in grade. No significant differences in special education placement were found for preschool model or sex. Special education placement during the primary grades was not related to family income as measured by eligibility for subsidized school lunch ($p = .44$) or to the child's living in a single-parent family ($p = .43$).

Boys were more likely to have been retained prior to Year 5 (34%) than were girls (10%), $\chi^2(1, N = 161) = 13.97$, $p < .001$. Similarly, teachers were likely to recommend more boys (23%) than girls (11%) for retention at the end of Year 5, $\chi^2(1, N = 165) = 4.28$, $p = .04$. Although no significant difference in retention rate attributable to preschool model was found for girls ($p = .41$), Model AD boys had a significantly lower rate of retention prior to third grade than did boys who had attended other types of preschool, $\chi^2(2, n = 71) = 7.20$, $p = .03$. Overall, fewer children who had attended Model AD preschools had been retained prior to third grade (10%), $\chi^2(2, N = 161) = 5.50$, $p = .06$, compared to retention rates of 24% and 26% for Models CI and M, respectively. There were no significant differences attributable to preschool model in teachers' recommendations for retention at the end of Year 5 ($p = .75$).

Other demographic factors (family income, single-parent families) that could contribute to retention in grade were examined. Lower-income children were more likely than higher-income children to have been retained prior to third grade, $\chi^2(1, N = 160) = 7.02$, $p = .01$. Although no significant difference in retention rate at the end of Year 5 was found between children who did or did not qualify for subsidized lunch ($p = .14$), teachers recommended far fewer children who did not qualify for subsidized lunch for retention than was expected statistically. Children who lived in single-parent versus two-parent families did not differ in retention rates prior to Year 5 ($p = .18$). At the end of Year 5, however, teachers were somewhat less likely to recommend retention for children who were growing up in two-parent families, $\chi^2(1, N = 133) = 2.44$, $p = .12$.

Year 6. Because children were of the age to be leaving the primary grades, this school district was now more inclined to recommend special education services for children who experienced academic difficulties, $\chi^2(1, N = 139) = 5.16$, $p = .02$. In Year 6, the number of children who received special education services increased to 8% of the sample. No significant differences in special education placement were found for preschool model or sex. Special education placement following the primary grades was somewhat related to family income, $\chi^2(1, N = 166) = 2.52$, $p = .11$. Only half as many children who did not qualify for subsidized lunch as expected

statistically were receiving special education services. Special education placement in Year 6 was not related to growing up in a single-parent family ($p = .31$). Possibly due to increases in special education placement, teachers' recommendations for retention at the end of Year 6 (10%) decreased in comparison with retention recommendations made at the end of Year 5 (16%). No significant differences were found in recommended retention at the end of Year 6 for preschool model, sex, or family income. Teachers were more likely to recommend children from single-parent families for retention at the end of Year 6 than children living in two-parent families, $\chi^2(1, N = 149) = 4.25, p = .04$.

Year 5 Report Cards

A 3 x 2 (Preschool Model x Sex) analysis of covariance (ANCOVA) was used to test for differential effects of preschool model on children's grades, sex differences, and possible Preschool Model x Sex interactions at the end of Year 5 in school. The covariate used to control for possible economic differences between children was eligibility for subsidized school lunch (based on family income and size). Although a direct measure of family income would have been a more desirable covariate, it was not available. Eligibility for subsidized school lunch should be highly correlated with family income and is a widely used estimate of family income in public school evaluation research. All reported means have been adjusted for the covariate. Missing scores were not imputed. The academic performance of children who were "on schedule" at the end of Year 5 (third grade), as well as performance of children who had been retained prior to third grade, was examined in this follow-up study.

Preschool Model. No significant main effect for preschool model was found in Year 5 overall GPA or any specific subject area for either "on schedule" or "retained" children. A statistical trend toward significant differences between preschool models was found for Year 5 citizenship grades, $F(2, 153) = 2.66, p = .07$. Overall, Model AD children received citizenship grades that were 6% and 19% lower than Model CI and Model M children, respectively. Citizenship grades reflect children's deportment in school. At the end of Year 5, children from the three different preschool models were performing academically at a comparable level. Teachers did, however, see the school behavior of children who had attended academically directed preschools as being notably poorer than that of peers.

Sex Differences. A significant sex difference was found in overall Year 5 GPA, $F(1, 153) = 4.05, p = .05$, with girls earning a 10% higher GPA than boys. Effect size for this difference was moderate (.34). As seen in Figure 1, girls earned higher grades in each of the 11 subject areas. A significant difference was found for citizenship grades, $F(1, 153) = 12.26, p = .001$, with teachers rating girls' school behavior 24% "better" than that of boys. Effect size for the difference in citizenship grades was large (.58). At the end of Year 5, girls were outperforming boys in school.

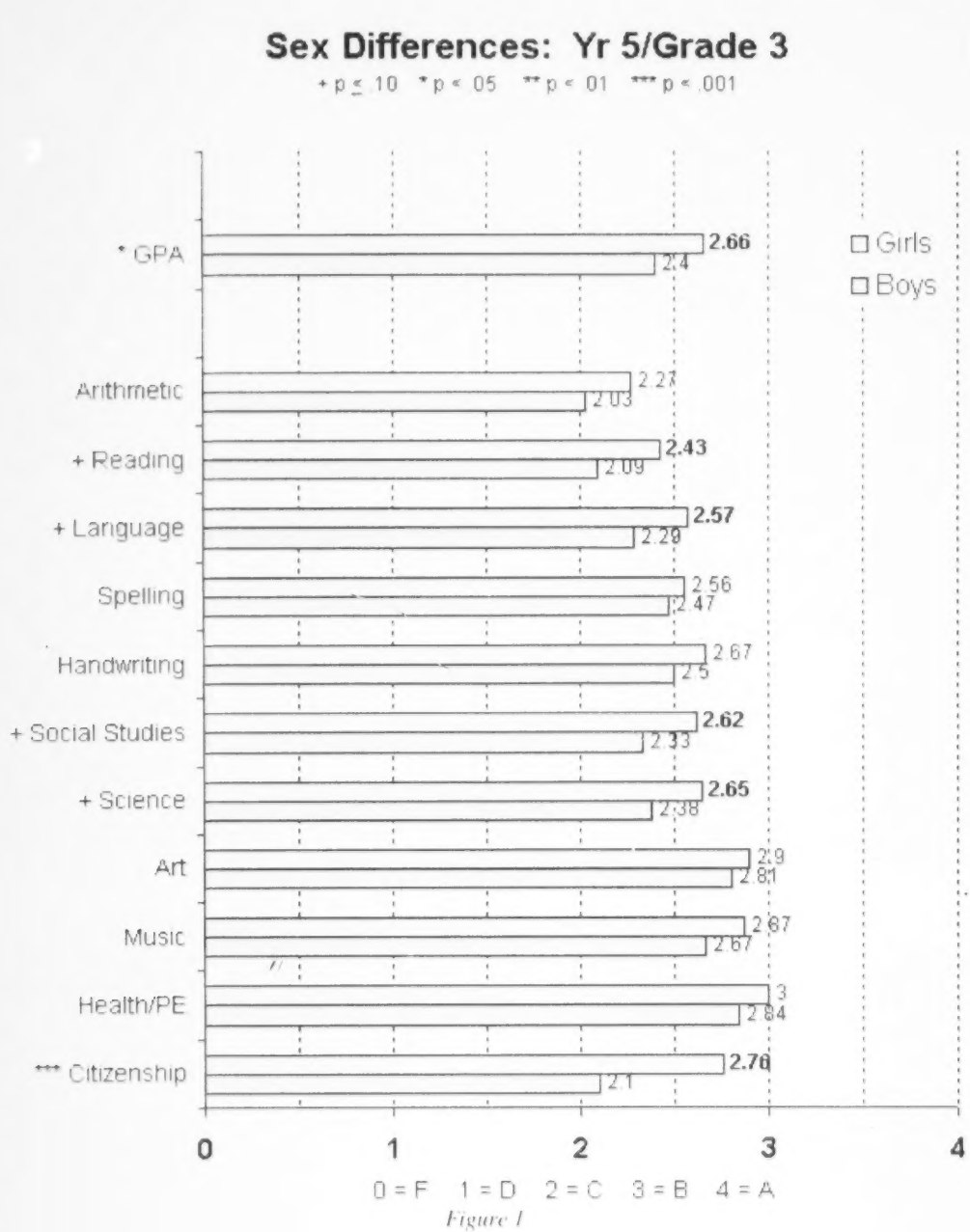

Figure 1

Interactions. No significant Preschool Model x Sex interactions were found for overall GPA or any of the 11 subject areas for either "on schedule" or "retained" children. No statistical trends toward significant group differences were found. The smallest gap between performance of boys and girls appeared for Model M children (boys' GPA was only 2% lower than girls' GPA). In four subject areas (language, spelling, art, and music), Model M boys received somewhat higher grades than did Model M girls. A similar pattern was not present in the other two preschool models.

Year 5 Summary. For children who had attended preschool and kindergarten prior to entering first grade, there was no significant difference in academic performance attributable to preschool

model at the end of children's fifth year in school. Girls outperformed boys in school, but this difference was less noticeable among children who had attended "combination" preschool classes. Teachers rated boys' school behavior lower than girls' behavior. Compared to peers, children who had attended academically directed preschool classes also were rated lower in behavior compared to peers at the end of their fifth year in school.

Year 6 Report Cards

Preschool Models. As shown in Table 1 and Figure 2, a trend towards statistical significance between preschool models was found in Year 6 overall GPA ($p = .07$). GPA for Model CI was 4% higher than Model M and 14% higher than Model AD. The difference between Models CI and AD was moderate (effect size = .38). In all subject areas except music, Model AD children displayed the lowest grades of the three preschool models. In all but three subject areas (language, social studies, and music), Model CI had the highest grades compared to peers who had other types of preschool experiences. Science grades of Model M children equaled those of Model CI. Post hoc Tukey's HSD ($p < .01$) indicated that Models CI and M earned significantly higher health/PE grades than did Model AD. By the end of Year 6, academic performance of children who had attended academically directed preschool classes was beginning to decline. Although not statistically significant, their school behavior continued to be rated somewhat lower than that of peers: Model AD citizenship grades were 14% and 9% lower than Models CI and M, respectively.

Table 1
Year 6 Report Cards: Preschool Model (PM) and Sex Differences (G/B)*

		Preschool Model					
		CI	M	AD	Girls	Boys	ANCOVA
GPA	*M*	2.56	2.46	2.25	2.59	2.25	PM: $F(2, 176) = 2.68$, $p = .07$
	SD	.82	.82	.74	.78	.78	G/B: $F(2, 176) = 9.11$, $p = .003$
Arithmetic	*M*	2.26	2.18	1.87	2.24	1.96	PM: $F(2, 173) = 2.18$, $p = .116$
	SD	1.10	1.20	1.00	1.04	1.16	G/B: $F(2, 173) = 3.00$, $p = .085$
Reading	*M*	2.33	2.11	2.02	2.35	1.96	PM: $F(2, 172) = 1.30$, $p = .27$
	SD	1.11	1.21	1.08	1.11	1.14	G/B: $F(2, 172) = 5.40$, $p = .02$
Language	*M*	2.28	2.29	2.10	2.36	2.08	PM: $F(2, 174) = .62$, $p = .54$
	SD	1.13	1.16	.94	1.12	1.02	G/B: $F(2, 174) = 3.06$, $p = .08$
Spelling	*M*	2.56	2.38	2.20	2.67	2.09	PM: $F(2, 174) = 1.22$, $p = .30$
	SD	1.27	1.35	1.29	1.27	1.27	G/B: $F(2, 174) = 9.22$, $p = .003$

Handwriting	*M*	2.59	2.39	2.37	2.56	2.34	PM: $F(2, 175) = .92$, $p = .40$
	SD	.98	.98	1.00	.96	1.01	G/B: $F(2, 175) = 2.13$, $p = .15$
Social Studies	*M*	2.37	2.48	2.07	2.49	2.12	PM: $F(2, 172) = 2.17$, $p = .117$
	SD	1.10	1.12	1.05	1.12	1.03	G/B: $F(2, 172) = 5.55$, $p = .02$
Science	*M*	2.57	2.57	2.27	2.60	2.34	PM: $F(2, 170) = 1.83$, $p = .16$
	SD	1.07	1.01	.87	.98	.98	G/B: $F(2, 170) = 3.30$, $p = .07$
Art	*M*	2.89	2.73	2.70	2.76	2.79	PM: $F(2, 158) = 1.05$, $p = .35$
	SD	.75	.75	.78	.75	.78	G/B: $F(2, 158) = .06$, $p = .81$
Music	*M*	2.72	2.78	2.74	2.85	2.64	PM: $F(2, 153) = .09$, $p = .91$
	SD	.91	.81	.81	.88	.78	G/B: $F(2, 153) = 2.38$, $p = .125$
Health/PE	*M*	3.05	2.90	2.42	2.92	2.66	PM: $F(2, 158) = 7.59$, $p = .001$
	SD	.97	.73	.96	.82	1.01	G/B: $F(2, 158) = 3.65$, $p = .058$
Citizenship	*M*	2.57	2.44	2.22	2.82	2.00	PM: $F(2, 152) = 1.22$, $p = .30$
	SD	1.19	1.35	1.25	1.08	1.28	G/B: $F(2, 152) = 20.13$, $p < .001$

*Note: Means adjusted for family income (eligibility for subsidized lunch) covariate.

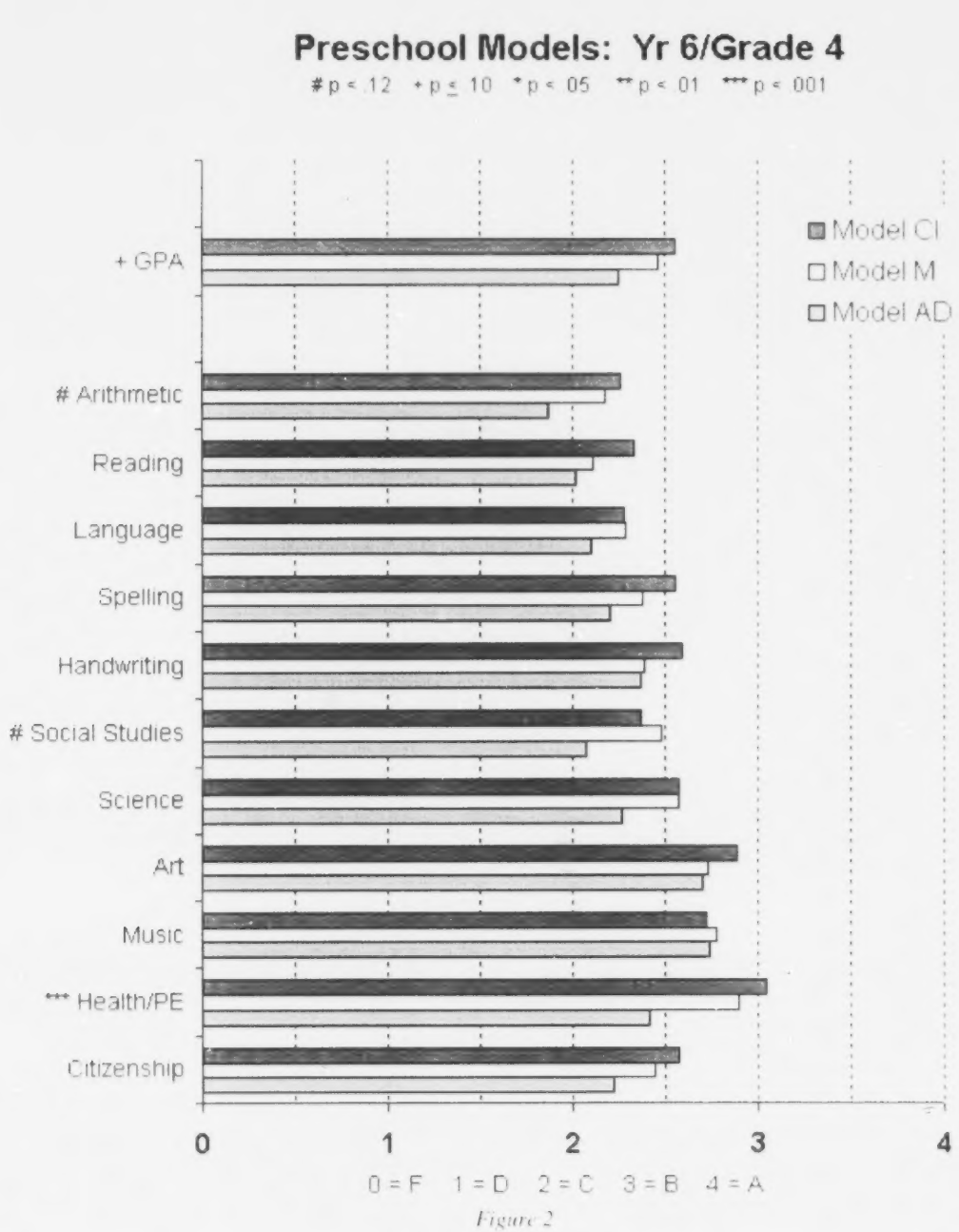

Figure 2

Sex Differences. As shown in Table 1 and Figure 3, a significant sex difference was found in overall GPA (p = .003), with girls receiving 13% higher grades than boys. Effect size for this difference was moderate (.44). Girls earned higher grades in all of the 11 subject areas except art. These differences were statistically significant for reading, spelling, social studies, and citizenship. Effect sizes for sex differences were moderate to large, with the greatest effect size seen in citizenship grades (.76). A trend toward statistically significant differences between girls and boys was found in four other subject areas: arithmetic, language, science, and health/PE. At the end of Year 6, girls continued to outperform boys in school.

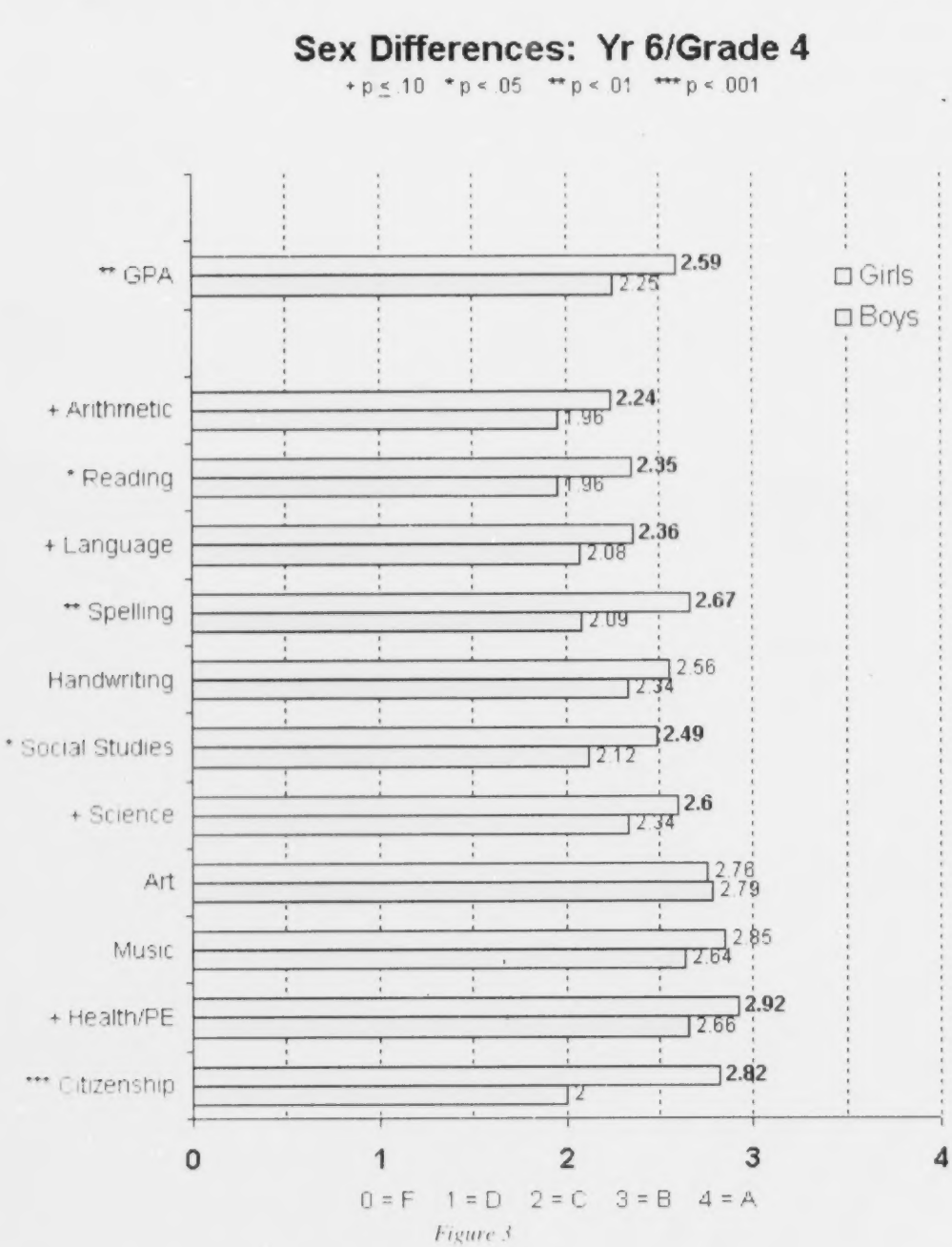

Figure 3

Interactions. No significant Preschool Model x Sex interactions were found for overall GPA or any of the 11 subject areas in Year 6. A possible interaction between preschool model and sex was found for Year 6 music grades, F (2, 153) = 2.59, p = .08. Unlike other boys, Model AD boys earned somewhat higher grades in music (6%) than did Model AD girls. However, at the end of children's sixth year in school, the smallest gap between school performance of boys and girls appeared for Model CI children. The GPA of Model CI boys was only 9% lower than that of girls, whereas a 16% and 14% difference between girls' and boys' GPA was found for Models M and AD, respectively.

Year 6 Summary. School performance of those who had attended academically directed

preschool classes was beginning to decline by the end of children's sixth year in school. Girls still outperformed boys in school, but this difference was now less noticeable among children who had attended child-initiated preschool classes. Teachers continued to rate school behavior of boys lower than that of girls. Although no significant differences attributable to preschool approach were found in behavior at the end of the sixth year in school, teachers continued to rate behavior of children with academically directed preschool experiences somewhat lower than their peers.

Transition from Year 5 to Year 6

A 3 x 2 x 2 (Preschool Model x Sex x Year) repeated measures multiple analysis of covariance (MANCOVA) with year as the repeated variable was used to test for differential effects of preschool model on children's grades, sex differences, and possible Preschool Model x Sex interactions across time (Year 5 to Year 6). As with previous analyses, the covariate used to control for possible influence of economic differences between children was eligibility for subsidized school lunch. Missing scores were not imputed.

Main Effect for Year. Although children's grades generally dropped as they left the primary grades and entered the later elementary school grades, no significant main effect for year was found in the subsample's overall GPA, F (1, 132) = .88, p = .35. Analyses of each subject area yielded only one significant main effect for year; subsample children's grades in language decreased 8% from Year 5 to Year 6, F (1, 131) = 4.78, p = .03. Effect size for this difference was small (.16).

Interactions across Years. Of greater interest in children's transition from the primary to the later elementary school grades was how an earlier preschool model or children's sex or both might differentially affect school performance across years. Therefore, two-way interactions (Preschool Model x Year; Sex x Year) and the possibility of a three-way interaction (Preschool Model x Sex x Year) were examined more closely.

As shown in Table 2 and Figure 4, there was a significant interaction between preschool model and year for GPA (p = .02). The GPA of Model CI children increased 6%, while GPA decreased 4% and 8% for Models M and AD, respectively. A similar pattern of Model CI increases and Models M and AD decreases was found in 6 of the 11 subject areas: reading, language, spelling, science, health/PE, and citizenship. In an additional three subject areas (arithmetic, art, and handwriting), Model CI grades either remained constant or increased. Model M grades increased in only one subject area, music. Model AD grades increased in only one subject area, handwriting. Finally, all three preschool models showed a drop in children's social studies grades from Year 5 to Year 6.

Table 2
ANCOVA Interactions for Preschool Model and Sex: Year 5 to Year 6

Model x Year	Sex x Year	Sex x Year	Model x Sex x Year
GPA	$F(2, 132) = 4.25$, $p = .02$	$F(1, 132) = .40$, $p = .53$	$F(2, 132) = .12$, $p = .89$
Arithmetic	$F(2, 130) = 3.37$, $p = .04$	$F(1, 130) = .07$, $p = .79$	$F(2, 130) = .32$, $p = .72$
Reading	$F(2, 130) = 3.19$, $p = .045$	$F(1, 130) = .07$, $p = .79$	$F(2, 130) = .27$, $p = .76$
Language	$F(2, 131) = 2.34$, $p = .10$	$F(1, 131) = .06$, $p = .80$	$F(2, 131) = .65$, $p = .53$
Spelling	$F(2, 131) = 3.38$, $p = .04$	$F(1, 131) = 4.17$, $p = .04$	$F(2, 131) = .16$, $p = .85$
Handwriting	$F(2, 131) = .71$, $p = .49$	$F(1, 131) = .13$, $p = .72$	$F(2, 131) = .93$, $p = .40$
Social Studies	$F(2, 129) = .15$, $p = .86$	$F(1, 129) = .00$, $p = .95$	$F(2, 129) = .11$, $p = .90$
Science	$F(2, 127) = .81$, $p = .45$	$F(1, 127) = .01$, $p = .91$	$F(2, 127) = 1.79$, $p = .17$
Art	$F(2, 109) = .34$, $p = .72$	$F(1, 109) = .12$, $p = .73$	$F(2, 109) = .86$, $p = .43$
Music	$F(2, 98) = .12$, $p = .89$	$F(2, 98) = .24$, $p = .62$	$F(2, 98) = .37$, $p = .37$
Health/PE	$F(2, 112) = 5.31$, $p = .006$	$F(1, 112) = 3.25$, $p = .07$	$F(2, 112) = 1.26$, $p = .29$
Citizenship	$F(2, 111) = 2.91$, $p = .06$	$F(1, 111) = .07$, $p = .80$	$F(2, 111) = 3.04$, $p = .05$

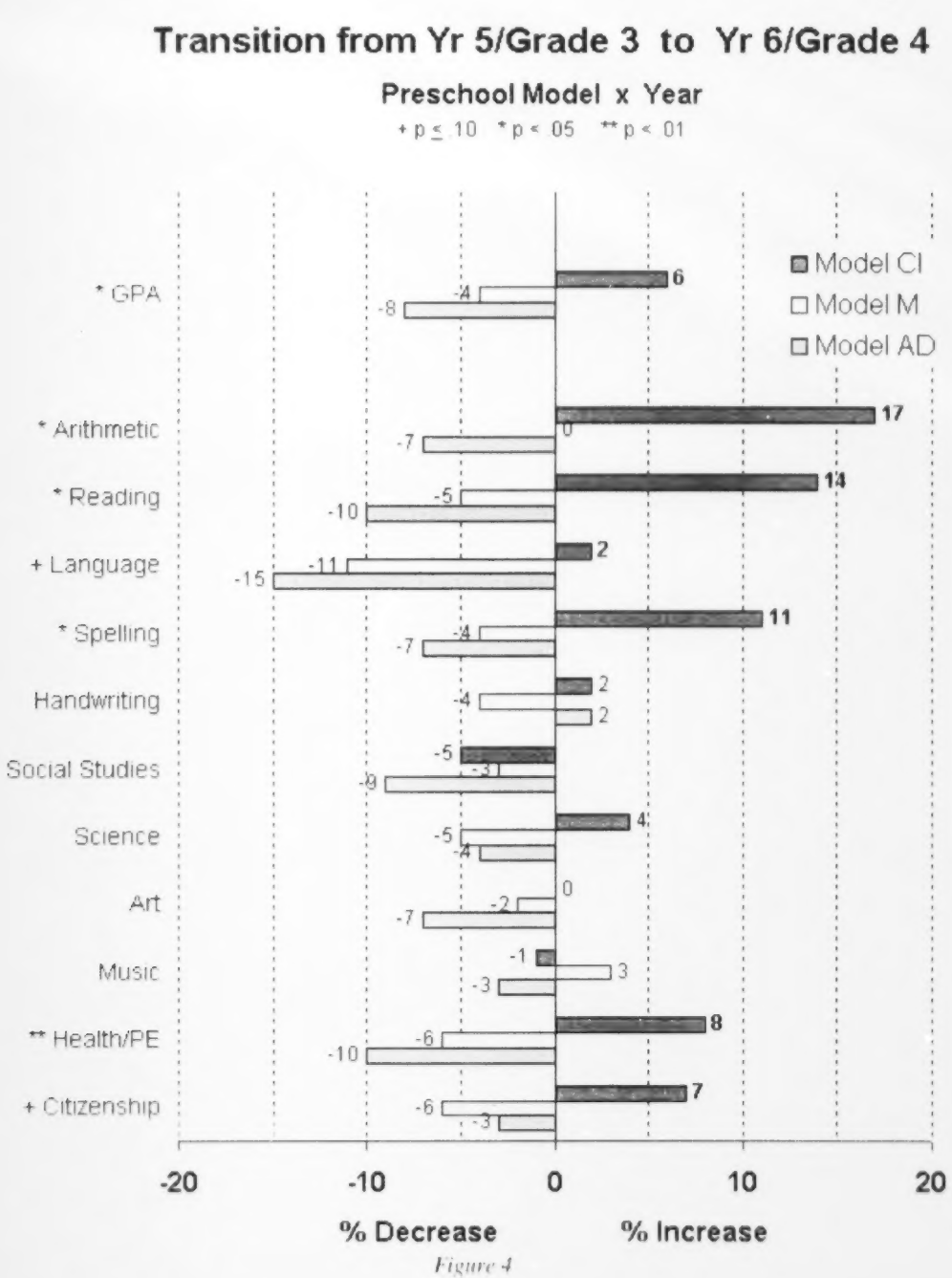

Figure 4

As shown in Table 2, four subject area Preschool Model x Year interactions were significant: arithmetic, reading, spelling, and health/PE. Statistical trends toward significant interactions were found for language and citizenship. Only one Sex x Year interaction was found to be significant. Girls' grades in spelling increased 3%, and boys' grades decreased. A somewhat similar pattern was found for health/PE grades ($p = .07$), with boys' grades decreasing 6% and girls' grades remaining constant in health/PE. This Sex x Year interaction pattern, however, was not typical of other subject areas.

Figure 5 shows increases or decreases in boys' and girls' grades across years for each preschool model. As seen in Table 2, citizenship was the only subject area to show a significant three-way interaction between preschool model, children's sex, and year ($p = .05$). Model CI boys and girls had similar increases in citizenship grades across years (8% and 6%, respectively). The overall decrease in Model M citizenship grades was due primarily to a 19% drop in boys' grades; Model M girls decreased only slightly (2%). Citizenship grades of Model AD boys increased 26%, while girls' citizenship grades decreased 7%. The source of boys' improvement was due primarily to fewer failing Year 6 citizenship grades among boys whose school deportment had been previously unacceptable. Even with this improvement, however, Model AD boys remained 11% behind Model CI boys in Year 6 citizenship grades. And, although improved, these Year 6 citizenship grades for Model AD boys still remained lower than citizenship grades of girls (33%, 32%, and 18% lower compared to Models CI, M, and AD girls, respectively).

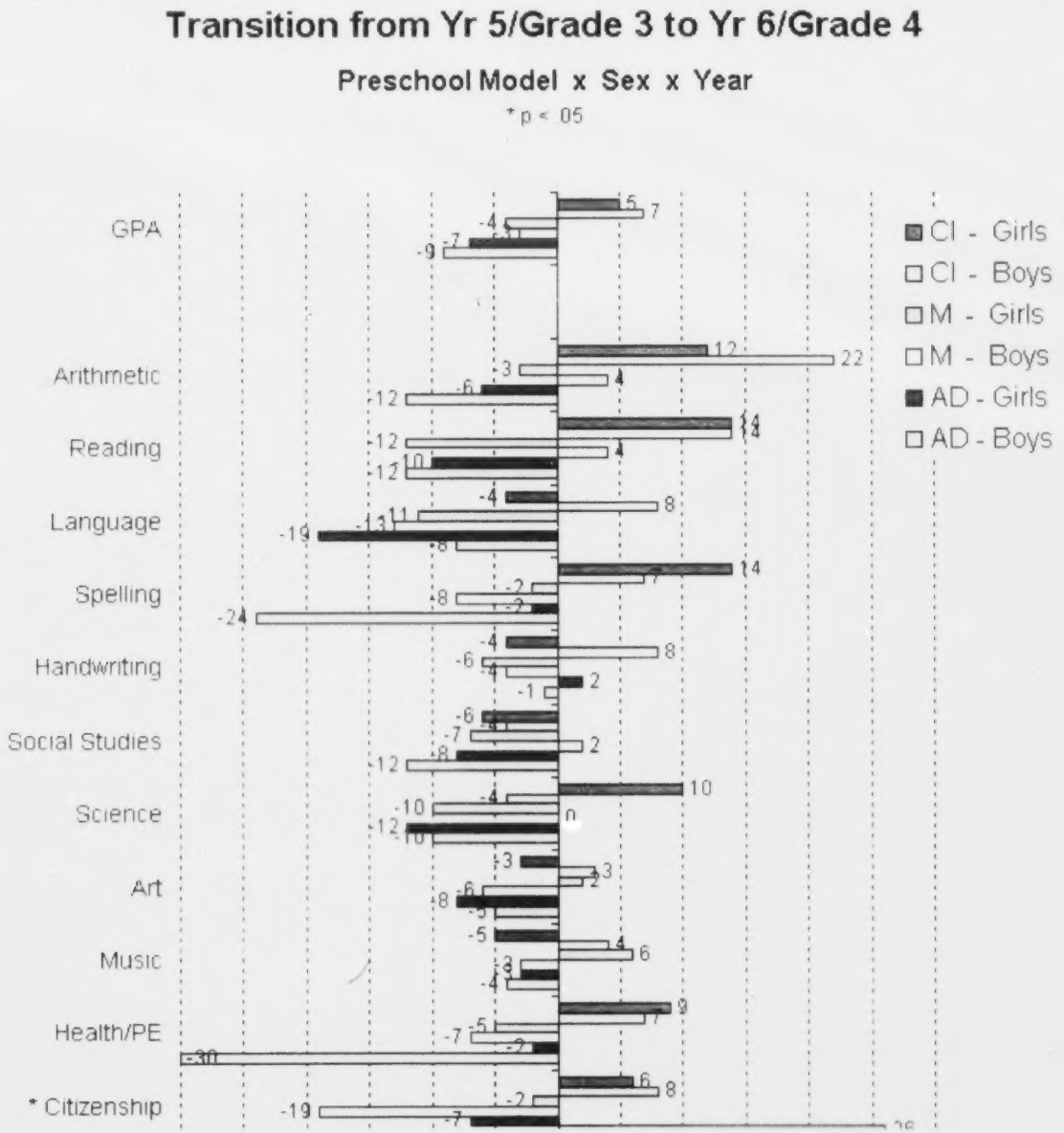

Figure 5

Discussion

As predicted, preschool model did have an influence on children's later school achievement. Children whose preschool experience was child initiated faired better than peers in the transition from the primary to the later elementary school grades. Not only were their overall grades following the transition significantly higher, their school performance improved or held constant in all but two subject areas (music, social studies) despite increased academic demands of the next grade level. Contrary to predictions, children from preschool classes where teachers had attempted to combine distinctive approaches were performing better in school than expected. By the end of their fifth year in school, they had "caught up" to classmates from other preschool models. Relative to peers, the position of children with combination approach preschool experiences was intermediary following the transition. Findings regarding later school success were somewhat mixed for children who had more didactic, academically directed preschool experiences. Although fewer of these children had been retained during the primary grades, children from this preschool model were least successful in making the transition to the later elementary school grades. Grades of children from academically directed preschool classrooms declined in all but one subject area (handwriting) following the Year 6 transition.

What contributed to the lower rates of retention prior to third grade among children whose earlier preschool experiences had been academically directed? One possibility is greater continuity between the preschool experience and what children encountered in this public school's kindergartens and primary grades. After preschool, these children were likely to enter a moderately academic kindergarten with more formal instruction practices in reading and arithmetic (Marcon, 1993). In fact, only 20% would have experienced a more socioemotional-oriented kindergarten in this school district, and virtually none of the first-grade classrooms that children entered would have resembled less academically focused preschools. Model AD children most likely had an easier transition to the primary grades. A second possibility involves family-related influences on early grade retention. Lower-income children in this follow-up study were more likely to have been retained prior to third grade. Children eligible for Head Start came from the lowest-income homes and in the setting of this study were likely to be growing up in single-parent families. No children eligible for Head Start in this study were enrolled in Model AD classes. Thus, lower retention of Model AD children could be more related to family income factors than to type of preschool experience. A third possibility is that grade-level placements may not fully reflect academic performance in a competency-based system of promotion that emphasizes basic reading and arithmetic skills. If mastery of critical skills in these two subjects was not demonstrated, children were automatically retained regardless of their performance in other subject areas. Likewise, children who demonstrated mastery of critical reading and arithmetic objectives were able to advance regardless of performance in other subject areas. Meeting basic competency requirements of the primary grades may not be sufficient to sustain later academic performance when "pulling it all together" requires more than just "adding up the pieces" children have acquired along the way. Children with academically directed preschool experiences may have missed out on the more integrative experiences of peers in other preschool models. Future research to investigate each of these

possibilities is needed.

By the end of the primary grades, there was little difference in the academic performance of children who had experienced three different preschool models. This finding was consistent with the developmental assumption that, by the end of third grade, most children will have attained the basic academic skills. Earlier limitations associated with a combination approach had been overcome, and children were generally academically comparable and on "even footing" when they entered the transition to the later elementary school grades. What happened on the other side of this transition? Why did academic performance of children from academically directed preschool classes begin to decline? The difference between their school grades and those of children from child-initiated preschools was not just statistically significant—the 14% difference in grades was of practical significance with children differing by more than a third of a standard deviation in overall grades. Perhaps the answer can be found in new demands characteristic of the later elementary school grades. Through the primary grades, children are learning to read. An academically directed approach typically emphasizes the act of reading over comprehension. Beginning in fourth grade, children are reading to learn; comprehension is critical. In fourth grade, they encounter more abstract concepts that do not necessarily match up with their everyday experiences. Additionally, fourth-grade teachers expect children to be more independent in the learning process, to assume more responsibility for their learning, and to show greater initiative. Perhaps teachers foster this independence by stepping back somewhat and shifting their instructional approach to be less didactic. It is at this point that motivation and self-initiated learning become crucial for children's later school success. This is the point at which Elkind (1986) and Zigler (1987) worried that short-term academic gains produced by overly didactic, formal instructional practices for young children would be offset by long-term stifling of children's motivation. Important lessons about independence and self-initiative are being learned in the early childhood years. Overly teacher-directed approaches that tell young children what to do, when to do it, and how to do it most likely curtail development of initiative during the preschool years. According to developmentalist Constance Kamii (1975, 1984), such an approach produces passive students who wait to be told what to think next. Therefore, it is not really surprising that children whose preschool experience may have curtailed initiative would find the transition to the later elementary school grades more difficult. The foundation of critical thinking may be found in early childhood experiences that foster curiosity, initiative, independence, and effective choice.

As predicted, earlier sex differences in school achievement favoring girls persisted both at the end of the primary grades and following the transition to the later elementary school years. Going into the transition, the smallest gap between boys' and girls' academic performance was seen among children who had attended preschool classes where teachers used a "combination" approach. On the other side of the transition, the smallest gap between the sexes was seen in children who had child-initiated preschool experiences. When academic demands increased, boys whose earliest school experiences involved active, self-initiated learning appeared to be better able to meet these new demands.

Although sex differences did not, as predicted, moderate the effect of preschool model across time, the closing of the academic gap between boys and girls following the primary grades was interesting. African American boys do not typically follow the academic pattern of boys in general by surpassing girls following the elementary school years. Might the boys in this predominantly African American sample whose preschool experience was active and child initiated break the pattern and pull ahead of girls, or at least stay close to girls, at the next major educational transition? Miller and Bizzell's findings (1984) suggest that this outcome is a

distinct possibility. And, if so, what is the underlying mechanism by which to account for such a possibility? How do cultural factors interact with and moderate the influence of various preschool models? The passivity required of children in an overly academically directed approach may be especially difficult for young African American boys. In the preschool years, girls' earlier maturation may have allowed them to better process the verbal instruction typical of didactic, academically directed instruction, whereas boys' generally slower rate of neurological development may have required a more active, "hands on" approach found in nondidactic, child-initiated early learning experiences. Lessons learned in the preschool years assuredly carry over into children's later school careers. The next academic transition, when children leave elementary school, will be especially interesting for understanding sex differences in academic performance of these low-income children.

Caution is warranted when interpreting this study's findings. First, and foremost, it is important to remember that the quasi-experimental design used in this research does not establish causality. Although parents did not choose their child's teacher or preschool model, neither did the researcher randomly assign children to preschool model at the beginning of this longitudinal study. This was a field study reflecting typical educational practices where children attend their neighborhood school. Second, because the research design is correlational, other intervening variables between preschool and fourth grade most likely contribute to these findings. For example, schools attended, as well as teachers and classmates, undoubtedly affect children's later school achievement. Additionally, the influence of family characteristics shown to positively affect educational outcomes of African American children (Luster & McAdoo, 1996) were not adequately examined in this study of intact groups. Only effects of family income and number of parents were investigated. Future research would be strengthened by greater attention to other family characteristics, such as parental beliefs, that are known to influence children's development (Sigel, 1985). Third, the follow-up sample did differ somewhat from the original in that it consisted of more minority children who were poorer and more likely to live in single-parent families than the sample originally studied. This difference, along with high attrition, was expected in a city where middle-class children often leave the public school system after kindergarten and children from highly mobile, lower-income families often relocate to a neighboring state. Because policy makers were interested in action research that could benefit children enrolled in their own school district, children who left this school system were not followed. Data from those who left the public schools would be interesting to examine. However, it is unlikely that these new data would have altered findings regarding the influence of preschool model because approximately equal numbers of children from each model were lost. Finally, use of individual children as the statistical unit of analysis, rather than school or classroom means, could limit generalizability of findings due to potential interdependence of grades for children in the same classroom. Unfortunately, even nested analysis of potentially nonindependent observations does not guarantee that statistical assumptions of independence of error will be met (Hopkins, 1982). The large number of schools (and hence of teachers) in this follow-up study reduces the possible effect of any particular teacher's grading practices on these findings. Concern about interdependence of grades assigned to children in the same classroom is also somewhat reduced by the competency-based grading system used in this school district. It is important to remember that the large number of schools and teachers sampled in this study enhances, but does not guarantee, generalizability of this study's findings.

Children's later school success appears to be enhanced by more active, child-initiated learning experiences. Their long-term progress may be slowed by overly academic preschool experiences that introduce formalized learning experiences too early for most children's developmental status. Pushing children too soon may actually backfire when children move into the later

elementary school grades and are required to think more independently and take on greater responsibility for their own learning process.

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